

a flexible cable. However, the ultrasonic transducer 32 of Terwilliger is not truly a viewing device, since it merely collects data which is generated only in response to ultrasonic energy transmitted by the transducer itself, and it appears that a full image cannot be created on a video monitor from that collected data without additional information as to the position of the transducer provided by Terwilliger's position sensor 78.

In any event, Terwilliger does not disclose an endoscope or any other kind of a device that employs a video camera. Nor would it be obvious to mount a camera in place of the ultrasonic transducer 32, since the transducer 32 is disposed within the body 12. Mounting a video camera within the body 12 would be impractical since the camera would not be able to view images exterior of the body 12.

Thompson 5,762,603 admittedly relates to an endoscope with a camera assembly that is capable of being moved. However, Thompson does not show a cable-type drive means as called for by Applicants' claims. Hence, the only relevancy of the Thompson reference is for its teaching of the use of a camera as part of an endoscope. However, as noted above, mounting a camera in the device of Terwilliger is not obvious since it would be impractical and serve no useful purpose.

Komiya 4,043,323 is relevant to the extent that it teaches an endoscope. However, it is of little relevance regarding the ability to maneuver or operate a surgical apparatus mounted at the end of an endoscope assembly. Komiya discloses merely the well-known concept of providing an endoscope with a channel to accommodate a forceps 10 for the purpose of introducing the forceps into the body cavity of a human being. Applicants respectfully submit that Komiya provides no teaching that would render it obvious to modify the apparatus of Terwilliger by incorporating therein a camera and a means for

manipulating that camera, even when the limited teaching of Komiya is combined with the disclosure of Thompson.

In support of the Section 103 rejection, the Examiner asserted certain conclusions that are not well founded. For one thing, the routing and support of the camera cable is not an obvious expedient, particularly since the references do not show any arrangement resembling that shown in Applicants' drawings. Further with reference to claim 29, the Examiner mentioned "spring clutches" as a means of optional drive provision. That statement by the Examiner is not understood since claim 29 does not specifically call for spring clutches. In this connection it should be noted that the Official Action did not identify which of the relied-upon references shows the combination called for by claim 29.

Claim 1 as amended specifically calls for first and second support members that are attached to and project from the distal and proximal ends respectively of the shaft, plus a camera mounting means pivotally attached to the first support member outside of said shaft, with the video camera carried by the camera mounting means. Additionally, the claim requires that the first and second strands of the flexible cable be attached to the camera mounting means outside of the shaft. Additionally, the claim calls for a camera cable connected to the camera for carrying video image signals from the camera to apparatus for processing the signals and generating a video display of the image seen by the camera. It is clear that the combination defined by claim 1 is neither disclosed nor rendered obvious by Terwilliger, whether considered alone or combined with Thompson and/or Komiya. As noted above, the Terwilliger apparatus has its sonic transducer 32, plus the platform supporting that transducer, located wholly within the body 12. That is different from Applicants' arrangement wherein the first support member and the camera carried by the camera mounting means are located outside of the shaft.

For the foregoing reasons, it is respectfully submitted that claim 1 is patentable over Terwilliger, Thompson and Komiya.

Claim 4 depends from claim 1 and adds the further limitation that the camera cable also includes means for transmitting light to an object viewed by the camera. That concept is completely alien to the references cited against claim 1. Therefore, claim 4 is believed to be allowable for that reason and also for the reason that it depends from claim 1 which is also allowable.

Claim 7 has been amended to call for a malleable shaft. Additionally, the claim calls for the support members to be attached to the opposite ends of the shaft. Further, claim 7 has been amended to provide further details of the operating means. And finally, claim 7 has been amended to require that the video camera be releasably carried by the camera mounting means. Since claim 7 is similar to claim 1, it is believed to be allowable for the same reasons. Additionally, claim 7 is believed to be allowable since it adds the further requirement that the shaft be malleable. That concept is not disclosed or rendered obvious by Terwilliger, Thompson or Komiya.

Claims 11-14 are now believed to be allowable in view of the fact that claim 11 has been amended to incorporate all of the limitations of the claims from which it previously depended. Therefore, further comment about those claims is not believed necessary.

Applicants request reconsideration of claim 20 since that claim has been amended to specify a support member attached to the distal end of the shaft, with the camera carrier being pivotally attached to that support member by a first pivot shaft that is rotatably coupled to said support member. Additionally, claim 20 requires that the cable embrace and be pinned to both the first and second pivot shafts. The concept of pinning the cable to both pivot shafts is not disclosed by Terwilliger, since it appears that Terwilliger pins his cable only to

the member 76. Accordingly, claim 20 is believed to be allowable over Terwilliger, Thompson and Komiya.

Claims 23-26 all depend from claim 20 and are believed to be allowable for the same reasons as claim 20. Additionally, claim 23 adds the requirement of a first guide member carried by the support member and a figure 8 configuration of the operating cable about the first pivot shaft and the guide member. That concept is novel with Applicants. Although the Examiner mentions the figure 8 pattern in connection with Terwilliger, there does not appear to be any teaching in Terwilliger for arranging the cable in a figure 8 configuration.

Claim 24 calls for a second support member and a second guide member, with the further requirement that the operating cable be arranged in a figure 8 configuration about the second guide member and the second pivot shaft. That combination of features also is novel and is not rendered obvious by Terwilliger, Thompson or Komiya.

Claim 26 adds the further requirement that the operating cable make more than one turn about at least one of the pivot shafts. That requirement, combined with the features of claim 20, makes claim 26 patentable over the prior art of record.

Claim 27 has been amended to require that the first and second support means project from the first and second ends respectively of the shaft. Additionally, claim 27 now calls for the two axles to be releasably connected to the two support means, with at least the first axle being located outside of the shaft. Additionally and most importantly, the claim has been amended to require that the cable be under tension, with the two axles being releasably maintained in connection with the two support means by a restraining force exerted on those axles by the cable as a result of the tension. That concept is completely novel, and Terwilliger, Thompson and Komiya have no teachings relevant thereto.

Claims 29, 31, 32 and 34 all depend directly or indirectly from claim 27 and are believed to be allowable for the same reasons. Additionally, claim 29 is patentable since it requires that the second support means be slidable lengthwise relative to the shaft, with spring means urging the second support means in a direction to maintain tension in the cable. That concept is completely novel with Applicants.

Claim 31 requires that the cable undergo a figure 8 routing at each of the first and second axles. That concept also is novel with Applicants. Moreover, there is no reason for such routing to be employed by Terwilliger.

New claim 36 depends from claim 29 and is believed to be allowable since it requires that the shaft be malleable. The use of a malleable shaft is not disclosed by Terwilliger, Thompson or Komiya.

New claim 37 is a more specific claim. Claim 37 specifies the construction of the video camera and also specifies that the camera mounting means comprise a pair of mutually-spaced resilient side walls for embracing and releasably gripping the video camera. Applicants submit that the combination of elements specified in claim 37 constitute a new and patentable combination.

Claim 38 depends from claim 37 and adds the further requirement that both the camera mounting means and the force applying means be releasably mounted to the first and second support means respectively. Claim 38 is believed to be allowable because of its own specific limitations as well as for the reason that it depends from claim 37 which is itself patentable.

The foregoing amendment constitutes a diligent attempt to expedite and advance the prosecution of this application, and it is believed to place the

application in condition for allowance. Therefore, prompt and favorable reconsideration is solicited.

Respectfully submitted,

By its attorneys:

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